LLNL Computation Directorate
(External) Invited Talks and Papers for CY 2003

1. Anderson, R. W., "Multilevel Adaptive Mesh Refinement for Structured ALE Hydrodynamics," keynote talk at *7th US National Congress on Computational Mechanics*, Albuquerque, NM, July 27, 2003.
2. Barter, R. H; "The Application of Systems Techniques to the Certification of a Nuclear Explosive Package"; *17th General Meeting of JOWOG 31*; AWE, Aldermaston, UK; Sept. 15–19, 2003.
3. Bass, N., "Integrating Linux in a Heterogeneous Environment," JOWOG, Albuquerque, NM, March 14, 2003; and Hex Lab Summit, Albuquerque, NM, May 19, 2003. UCRL- PRES-152289.
4. Benedict, R., "Successful Implementation of a Software Process Improvement Program," *DOE Software Quality Forum (SQF) 2003*, Arlington, VA, March 25–26, 2003.
5. Bihari, B. L. P. N. Brown, "Weighted Essentially Nonoscillatory (WENO) Schemes for the Boltzmann Transport Equation," UC Davis, CA, November 14, 2003.
6. Bihari, B. L., P. N. Brown, "On high-order nonlinear schemes for the Boltzmann transport equation," *International Conference on Scientific Computation and Differential Equations (SciCADE)*, Trondheim, Norway, June 30–July 4, 2003. UCRL-JC-152354 abs.
7. Bihari, B. L., W. S. Don, "High-order numerical methods for unsteady hydrodynamical simulations," *Konkoly Observatory, Hungarian Academy of Sciences,* Budapest, Hungary, July 7–8, 2003. UCRL-JC-152356 abs.
8. Bihari, B. L., W. S. Don, L. Jameson, O. Schilling, "Hybrid WENO-Central Schemes Based on Multiresolution Decomposition," *Second MIT Conference on Computational Fluid and Solid Mechanics*, Cambridge, MA, , June 17–20, 2003. UCRL-PRES-151474.
9. Boas, W., "Storage on the Lunatic Fringe: NNSA Advanced Simulation and Computing Program (ASC)", workshop panel, *SC03*, Phoenix, AZ, Nov. 15–21, 2003. UCRL-PRES-201057.
10. Bosl, W., A. Mirin and P. Duffy, "High-Resolution Climate Simulation and Regional Water Supplies," *Conf. on High-Speed Computing*, Salishan, OR, April 2003. UCRL-PRES-152874.
11. Casavant, D., R. Carey, B. Cline, L. Lagin, P. Ludwigsen, U. Reddi, P. Van Arsdall, "Testing and Quality Assurance of the Control System During NIF Commissioning," *ICALEPCS 2003*, October 2003. UCRL-JC-152870.
12. Chow, E., "A Survey of Incomplete Factorization Preconditioners," *Pacific Institute for Mathematical Sciences Workshop on Numerical Linear Algebra and Applications,* Vancouver, Canada, August 4–8, 2003. UCRL-PRES-155107.
13. Chow, E., "How to Use Hybrid MPI–OpenMP on IBM SP Systems," *SIAM Conf. on Computational Science and Engineering,* San Diego, CA, Feb. 10–13, 2003. UCRL-PRES-149604.
14. Chow, E., "MATLAB in Numerical Linear Algebra Research," *2003 SIAM Annual Meeting,* Montreal, Canada, June 16–20, 2003. UCRL-PRES-153686.
15. Chow, E., "Spectral-Type Multilevel Preconditioners," *2003 SIAM Annual Meeting,* Montreal, Canada, June 16–20, 2003. UCRL-PRES-153685.
16. Chow, E., "Multilevel Methods Based on Aggregation," *Fifth International Congress on Industrial and Applied Mathematics,* Sydney, Australia, July 7–11, 2003. UCRL-PRES-154066.
17. Critchlow, T., "A CS View on Issues Surrounding High-throughput Biological Data Generation," *Genomes to Life Workshop*, Arlington VA, February 2003.

18. Critchlow, T., "Approximate *Ad-Hoc* Queries: Helping to Understand Large-Scale Mesh Data," *Molecular Medicine 2003*, San Jose, CA, March 2003.
19. Critchlow, T., "Towards Automatic Discovery and Identification of Web-based Data Sources," *Dagstuhl Seminar on Data Quality and the Web*, Schloss Dagstuhl, Germany, September 2003.
20. Critchlow, T., "Why Does a Computer Scientist Need to Understand Mathematics?" Las Positas College, Livermore CA, March 2003.
21. Cupps, K., R. Teslich, "Benchmarking Efforts at LLNL" Systems of Labs Computing Coordinating Committee (SLCCC), October 29, 2003.
22. de Supinski, B. R., A. Snavely, and Y. Zhang, "PERC Tools for Performance Data Gathering, Analysis and Modeling," *ScicomP8*, Minneapolis, MN, August 5–8, 2003. UCRL-PRES-154710.
23. de Supinski, B. R., et al., "PERC Performance Tools: Accomplishments and Vision," *Workshop on Performance Characterization, Modeling and Benchmarking for HPC Systems*, Emeryville, CA, May 5–7, 2003. UCRL-PRES-153355.
24. Dubois, P. F., T. Epperly, and G. Kumfert, "Why Johnny Can't Build," *Computing in Science and Engineering*. UCRL-JC-154042, July 2003.
25. Eliassi-Rad, T., "Statistical Modeling of Large-Scale Scientific Simulation Data," University of California, Davis, November 6, 2003. UCRL-PRES-200856; also presented at Stanford University, March 6, 2003. UCRL-PRES-151854.
26. Falgout, R.D., "On Generalizing the AMG Framework," *Eleventh Copper Mountain Conference on Multigrid Methods*, Copper Mountain, CO, March 30–April 4, 2003; also presented at *Fraunhofer-Institute for Algorithms and Scientific Computing*, Germany, June 2003, *University of Erlangen*, Germany, June 2003, *Oberwolfach Conference*, Germany, June 2003; and *5th International Congress on Industrial and Applied Mathematics*, Sydney, Australia, July 2003. UCRL-PRES-150807.
27. Fattebert, J. L., "Finite Difference Method for Electronic Structure Calculations," Lawrence Berkeley National Laboratory, September 18, 2003. UCRL-PRES-200076.
28. Fodor, I., "Challenges and Opportunities in Scientific Data Mining," *VIGRE Seminar*, University of California, Berkeley, October 2003. UCRL-PRES-200590.
29. Fodor, I., "Using Independent Component Analysis to Separate Signals in Climate Data," *Neyman Seminar*, University of California, Berkeley, November 2003. UCRL-PRES-151808.
30. Frank RJ and Heermann P, "Next Generation Infrastructure for Scalable Displays," *High Information Content Display Systems Symposium*, Arlington, VA, October 2003.
31. Frank RJ, "Parallel Distributed Rendering Stack: Progress and Status & New Capabilities and Trends in Commodity Graphics Cards," *DOE Computer Graphics Forum*, Granlibakken, April 27–30, 2003.
32. Frank RJ, "Production Cluster Visualization: Experiences and Challenges," Keynote, *IEEE Visualization 2003: Workshop on Parallel Visualization and Graphics*, Seattle, WA, Oct. 19–24, 2003.
33. Frank RJ, "Streaming Through My Playstation: Future Directions for Hardware and Software Applications," *Engineering Opportunities in the 21st Century Conference*, LLNL, March 12–13, 2003.
34. Frank RJ, "The Evolution of Distributed Visualization Clusters," Keynote, *Symposium on the Use of Commodity Clusters for Large-Scale Scientific Applications*, Tyson's Corner, VA, July 2003.
35. Frank RJ, "Visualization Environment Issues for Terascale Data, Advanced Display Environments Workshop," Arctic Region Supercomputing Center, Fairbanks, AK, August 6–8, 2003.

36. Gardner, S., "Computational Prediction of DNA and Protein Signatures for Pathogen Detection," British Columbia Cancer Center, Vancouver, BC, Canada, October 2003. UCRL-PRES-200242.
37. Hornung, R.D., "Hybrid Continuum-Atomistic Simulations for Multiscale Hydrodynamics," *SIAM Conference on Computational Science and Engineering (CSE03)*, San Diego, CA, February 10–13, 2003. UCRL-PRES-149710.
38. Howell, L. H., "A Parallel AMR Implementation of the Discrete Ordinates Method for Radiation Transport," *Chicago Workshop on Adaptive Mesh Refinement Methods,* Chicago, IL, September 3–5, 2003. UCRL-PRES-152173.
39. Keasler, J., "The Vista Framework for Generalized Mesh Computations," at minisymposium "Supporting Infrastructures for Computational Mechanics" in the *Seventh U.S. National Congress on Computational Mechanics*, Albuquerque, NM, July 27–31, 2003. UCRL-PRES-153240.
40. Kostova, T., and T. Carlsen, "Effect of Fragmentation on the Time to Extinction of Prairie Vole Populations in Tallgrass Prairie," *Alcalá 2nd International Conference on Mathematical Ecology*, Alcala de Henares, Spain, September 5–9, 2003, UCRL-PRES-200041.
41. Larsen, S., "High performance computing in the Earth Sciences," University of Tokyo, Tokyo, Japan, January 2003. UCRL-JC-149756.
42. Lee, Steven L., "Sensitivity Analysis for Scientific Simulations: Software and Applications," *SIAM Conference on Computational Science and Engineering,* San Diego, CA, February 10–13, 2003. UCRL-VG- 202454.
43. Lindstrom, Peter, "Interactive Visualization of Large Geometric Data Sets," *Chalmers University of Technology*, Gothenburg, Sweden, June 10, 2003. UCRL-PRES-154098.
44. Lindstrom, Peter, "Out-of-Core Surface Simplification," University of California, Davis, CA, February 6, 2003. UCRL-PRES-151935.
45. Lindstrom, Peter, "Streaming Meshes," *Dagstuhl Seminar on Scientific Visualization*, Wadern, Germany, June 4, 2003. UCRL-PRES-153876.
46. Marlais, Sue, "Desktop Initiatives 2003," *Hex Lab Summit*, Albuquerque, NM, May 19, 2003.
47. Max, N., P. Williams, C. Silva, and R. Cook, "Volume Rendering for Curvilinear and Unstructured Grids," *Proc. of Computer Graphics International* 2003, pp. 210–215.
48. Ovcharenko, I., "Algorithms for Genome Comparison," tutorial, Cold Spring Harbor Laboratory, Cold Spring Harbor, NY, November 2003.
49. Ovcharenko, I., "Genome Comparison Biology," tutorial, Cold Spring Harbor Laboratory, Cold Spring Harbor, NY, November 2003.
50. Petzold, L.R., Y. Cao, S. Li, and R. Serban, "Adaptive Numerical Methods for Sensitivity Analysis of Differential–Algebraic Equations and Partial Differential Equations," *Proc. of Workshop on Modeling and Simulation in Chemical Engineering*, Coimbra, Portugal, 2003.
51. Quinlan, D., "Automated Introduction of User-defined Locality Optimizations," *SIAM CSE'03 Symposium: "Locality in Scientific Applications,* San Diego, California, February, 2003.
52. Reynolds, D. R., and P. Kloucek, "Modeling Phase Transitions in Shape Memory Alloys," *Solution Methods for Large-Scale Nonlinear Problems*, Livermore, CA, Aug. 6–8, 2003. UCRL-JC-154606.
53. Reynolds, D. R., "A Nonlinear Thermodynamic Model for Phase Transitions in Shape Memory Alloy Wires," *Princeton Plasma Physics Laboratory,* Princeton, NJ, October 21, 2003. UCRL-200004-PRES.
54. Seager, M., "LLNL Site Report", *NNSA & NASA Linux Summit*, LLNL, February 27, 2003. UCRL-PRES-152498.

55. Seager, M., "LLNL Linux Strategy and Overview: A Partnership Open Source Approach to Production Quality Clustering Environment," *NNSA & NASA Linux Summit,* LLNL, February 27, 2003. UCRL-PRES-152502.

56. Seager, M., "Operational Machines: ASCI White," *SOS7 Workshop on Distributed Supercomputing*, Durango, CO, March 4–6, 2003. UCRL-PRES-152497.

57. Seager, M., "Planned Machines: ASCI Purple, ALC, and M&IC MCR," *SOS7 Workshop on Distributed Supercomputing*, Durango, CO, March 4–6, 2003. UCRL-PRES-152496.

58. Seager, M., "Defining Extreme Scale Computing: ASCI Purple," *IDC HPC User Forum*, Sundance, Utah, April 7–9, 2003. UCRL-PRES-152985.

59. Seager, M., "Tera-Scale Linux Cluster." *IDC HPC User Forum*, Sundance, Utah, April 7–9, 2003. UCRL-PRES-152986.

60. Seager, M., "ASCI Purple is Delivering to the Program by Pushing the State-of-the-Art in Extreme Scale Computing," *NRC/CSTB Future of Computing*, Stanford, CA, May 21, 2003. UCRL-PRES-153564.

61. Seager, M., "A Scalable Architecture for a Multi-Cluster Production Simulation Environment," *Cluster Symposium*, Tyson's Corner, VA, July 22–23, 2003. UCRL-PRES-154570.

62. Seager, M., A. Koniges, D. Eder, R. Rabenseifner, "Real World Techniques for Scientific Applications of Scale," tutorial *SC03*, Phoenix, AZ, Nov. 15–21, 2003. UCRL-PRES-200933.

63. Seager, M., "Linux Clusters for Extremely Large Scientific Simulation," *Cluster 2003*, Hong Kong, Dec. 1–4, 2003. UCRL-PRES-201184.

64. Serban, R., "Sensitivity Capabilities in SUNDIALS," *7th US National Conference on Computational Mechanics,* Albuquerque, NM, July 27–31, 2003. UCRL-PRES-154599.

65. Serban, R. , "SUNDIALS: Suite of Nonlinear/Differential/Algebraic Equation Solvers," *SIAM Conference on Computational Science and Engineering,* San Diego, CA, February 10–13, 2003. UCRL-PRES-149711.

66. Slezak, T., "Computational Analysis of Bio-Threat Agents: From Algorithms to Assays," *Computational Genomics VI,* keynote, Boston, MA, October 2003. UCRL-PRES-155348.

67. Storch, N., "First Tri-Lab SQA Best Practices Workshop," *NWC Software Quality Assurance Subcommittee*. UCRL-PRES-155545, September 2003.

68. Storch, N., "LLNL ASCI SQA Status," *NWC Software Quality Assurance Subcommittee*. UCRL-PRES-155544, September 2003.

69. Vassilevski, P. S., "A General Framework for Algebraic Multigrid," *2003 International Conference On Preconditioning Techniques For Large Sparse Matrix Problems in Scientific and Industrial Applications,* plenary talk, Napa, CA, October 27–29, 2003. UCRL-PRES-200478.

70. Vassilevski, P. S., "Algebraic Multigrid for Finite Element Problems Containing Forms With Large Null Space," *Numerical Analysis Conf.,* College Station, TX, January 24–25, 2003. UCRL-PRES-150215.

71. Vassilevski, P. S., J. E. Jones, and C. Woodward, "Nonlinear Schwarz–Fas Methods for Unstructured Finite Element Elliptic Problems," *2nd Annual M.I.T. Conf. on Comput. Fluid & Solid Mech.,* Cambridge, MA, June 17–20, 2003. UCRL-JC-150427.

72. Vassilevski, P., "Element Agglomeration Coarsenings Applied to Non-Traditional Unstructured Finite Element Problems," *SIAM Conf. Comput. Science & Engineering,* San Diego, CA, February 10–12, 2003. UCRL-PRES-151114.

73. Vinzant, A., "Implementation of a Persistent Information Registry for the Long Term Maintenance of Critical Information," *17th General Meeting of JOWOG 31*, AWE, Aldermaston, UK, September 15–19, 2003.

74. Woodward, C., "Solution Methods for Large-Scale Nonlinear Diffusion Problems," *Women of Applied Mathematics Research and Leadership Conference*, Oct. 8–10, 2003, Univ. of Maryland, College Park, MD; also presented at *Perspectives on Nonlinear Equations and Optimization Conference in Honor of Homer Walker*, Sept. 20, 2003, Worcester Polytechnic Institute, MA.

75. Woodward, C., "SUNDIALS: Suite of Nonlinear and Differential/Algebraic System Solvers," Oct. 23, 2003, Princeton Plasma Physics Laboratory, NJ. UCRL-PRES-200666.

76. Woodward, C., M. Dumett, K. E. Grant, J. Jones, and R. Maxwell, "Nonlinear Solution and Sensitivity Methods for Variably Saturated Flow," *Workshop on Simulation and Optimization*, Research Triangle Park, NC, April 29, 2003.

77. Woodward, C., P. N. Brown, and K. E. Grant, "Using Sensitivities in the Calculation of Uncertainties for 3-D Time-Dependent Neutral Particle Transport," *SIAM Conference on Computational Science and Engineering*, San Diego, CA, February 2003. UCRL-PRES-151773.